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OPERATING AND INSTALLATION INSTRUCTIONS
FOR

VOICE CHANNEL MODULE VCH-1A and VCH-3A

(GDC Part Nos. 036P071-001, -003)

General DataComm Industries, Inc.
One Kennedy Avenue
Danbury, Connecticut 06810

MP MASTER
MA33467

Issue 1, June 1983

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Warning: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

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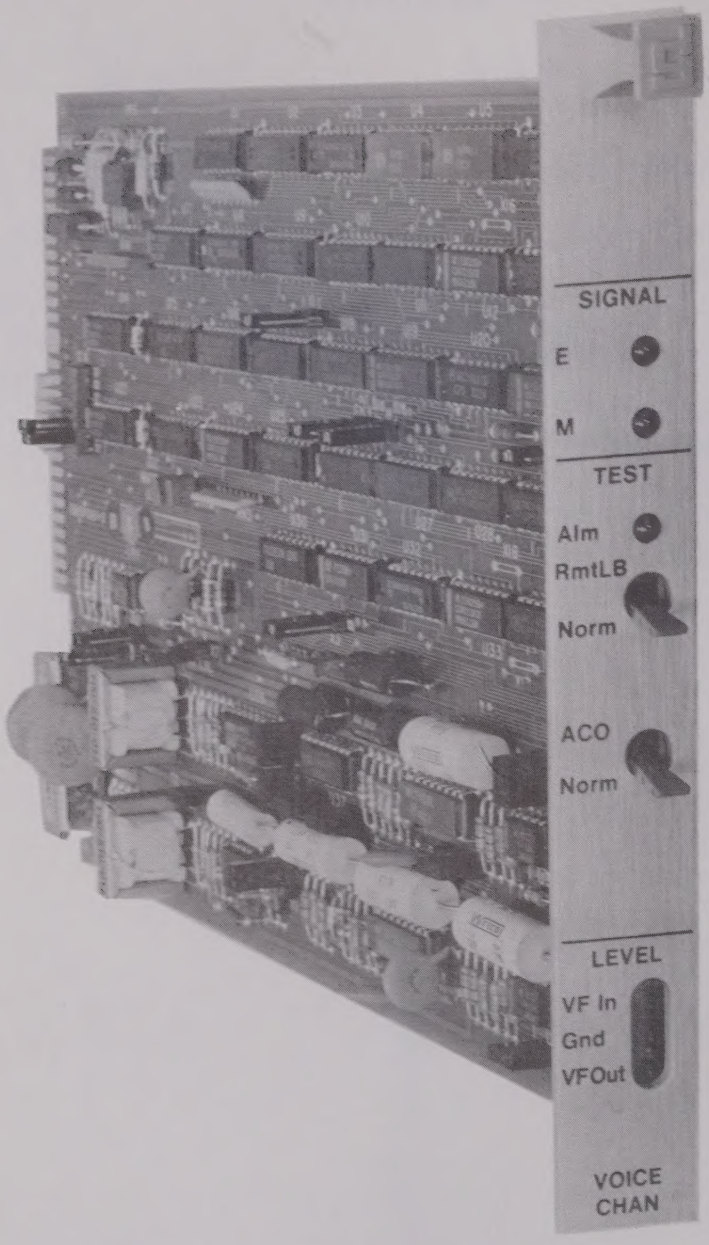


FIGURE 100-1. VOICE CHANNEL MODULE

SECTION 100 — GENERAL INFORMATION

1.0 SCOPE

This manual provides instructions for the GDC Voice Channel module, GDC Part No. 036P071. The module, shown in Figure 100-1, is a plug-in module of the Series 1250 Time Division Multiplexers, designed and manufactured by General DataComm Industries, Inc., Danbury, Connecticut.

This instruction manual is one of a complete family of publications which, when integrated with other publication units, describes a specific configuration of a Time Division Multiplexer within the TDM series product line.

1.1 DIFFERENCE DATA SECTION

Difference Data Sheets that define the latest equipment modifications may accompany this manual. The cover sheet for each set of Difference Data Sheets is printed on buff paper and numbered and summarizes the changes as well as lists the affected pages. The updated (affected) pages are printed on pink paper and stapled to the cover sheet. Insert these pink pages into the appropriate sections of the manual and place the cover sheet along with the replaced, obsolete pages behind the cover sheet in Section 700 for future reference.

In some cases, the Difference Data Sheets will have been incorporated into the manual. The buff sheet will then appear in Section 700 with the obsolete pages immediately behind it. As a result, this manual will always be applicable to existing units previously delivered.

Should numbered subparagraphs (e.g., 1.1.1, 1.1.2, etc.) follow this paragraph, they will define each Difference Data Sheet already incorporated into this manual.

1.2 REPLY CARDS

The last page in this manual contains two postpaid return cards on which the user may comment on deficiencies in the manual or make suggestions for improving the manual. The cards are perforated for easy removal from the manual.

2.0 PURPOSE AND USE

The Voice Channel module permits the TDM 1250 multiplexer series to be used for voice transmission and digital data transmission. In effect, the module digitizes the voice-frequency (VF) analog signal for transmission as aggregate data; a similar module at the far site converts the digital signal back again into telephone quality voice signals. It uses continuously variable slope delta modulation (CVSD) as the A/D and D/A conversion technique. The CVSD companding algorithm provides an efficient method for digitizing voice input and realizing the full dynamic range required by the Voice Channel.

The Voice Channel module is available in two versions. VCH-1A (GDC Part No. 036P071-001) presents an interface equivalent to, in terms of signal levels, impedance and other characteristics, that of a four-wire voice carrier channel with the added ability to accept E and M signaling. VCH-3A (GDC Part No. 036P071-003) provides the four-wire voice carrier channel but excludes the E and M signaling capability. The front panel E and M indicators are therefore omitted in the VCH-3A.

The Voice Channel interfaces with the TDM common equipment in the same manner as a synchronous channel module; it directly replaces the synchronous channel.

NOTE

The VCH-1A cannot be used in channel slot 22 of the TDM 1257/58.

The Voice Channel requires a 128-kHz clock signal for internal timing, and a second clock, the data rate clock, nominally running at 32 kHz (the data rate clock range is from about 16 kHz to 64 kHz: voice quality is degraded at lower frequencies; the S/N ratio improves as frequency increases). These two clock signals are jumper-selected from the seven available TDM clock buses.

A typical simple application of the Voice Channel module is shown in Figure 100-2.

2.1 E AND M SIGNALING

The E and M signaling subsystem, available on VCH-1A, provides a means for supervisory pulse communications between the local and remote telephone networks. Signaling data signals are transmitted over the same path as voice data, with E and M signaling taking priority. The voice transmission

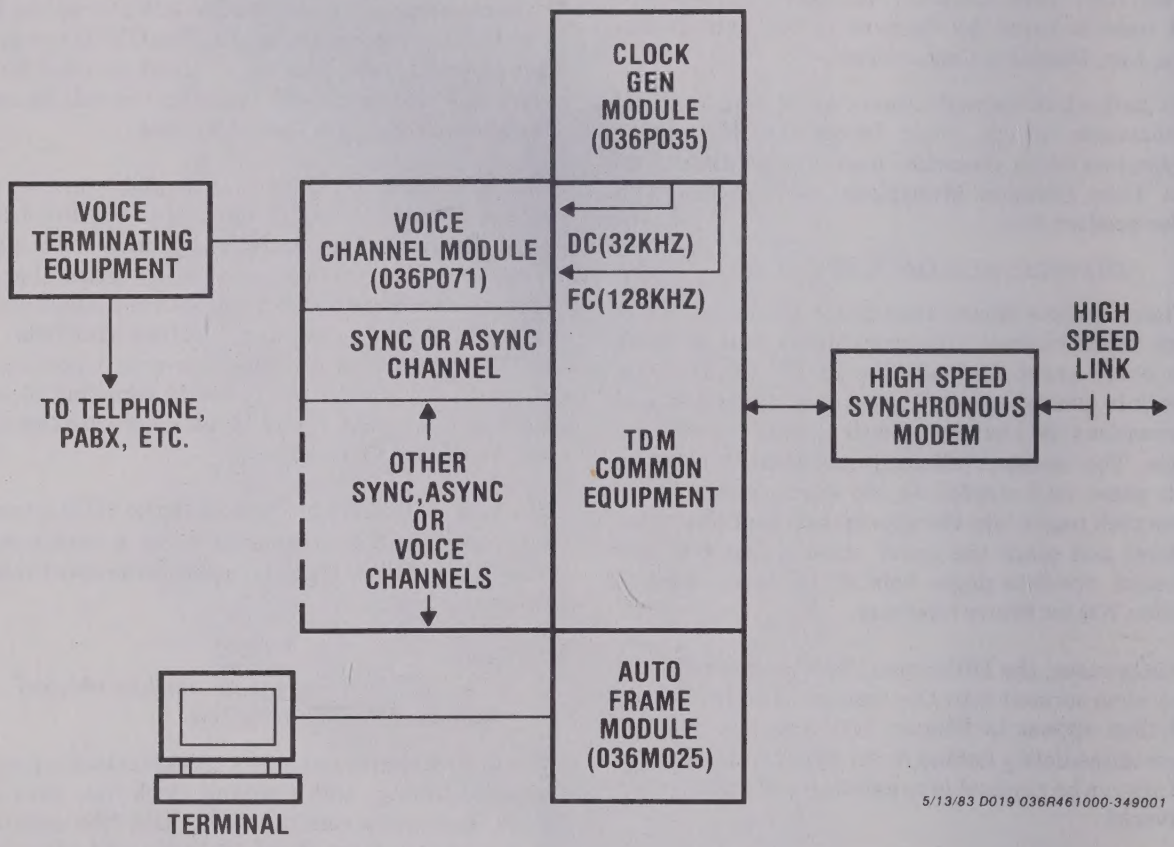


FIGURE 100-2. TYPICAL VOICE CHANNEL MODULE APPLICATION

path is active regardless of the state of the M-lead, except for 4.5 ms coinciding with transitions of the M-lead. The E and M interface conforms to telephone central office signaling conventions.

3.0 TECHNICAL CHARACTERISTICS

The technical characteristics of the Voice Channel module are given in Table 100-1.

4.0 PHYSICAL DESCRIPTION

The Voice Channel module (Figure 100-1) consists of a standard 6 1/4-inch by 9-inch printed circuit card with a panel flange attached to the front edge. The front panel contains switches for loopback and alarm control, indicators for E and M signal states (these indicators are eliminated on VCH-3A) and for alarm conditions, and test points for VF measurement at input and output. The module connects to the TDM backplane through a 56-pin card edge connector; the signals present at the card edge connector (P1) are listed in Table 100-2. The module weighs approximately 10 ounces.

5.0 AVAILABLE OPTIONS

The module provides field-configurable options that fall into the following categories:

- Configuration for operation with TDM 1253 or 1257/1258 systems.
- Input and output level selection.
- E and M signaling option selection (except on version VCH-3A).

These options may be configured to meet system requirements by proper placement of jumper plugs on header pins. To identify and select specific options, refer to Section 200, Installation.

TABLE 100-1. TECHNICAL CHARACTERISTICS

Item	Characteristic	
Digital interface	Similar to standard synchronous channel	
Telephone interface	Four-wire plus E and M signaling (VCH-3 excludes E and M signaling)	
Impedance	600 ohms ±10%	
Return loss	28 dB minimum	
Longitudinal balance	65 dB minimum	
Usable bandwidth	300 to 3400 Hz	
Level selection	0 or -16 dBm at transmitter input 0 or +7 dBm at receiver output	
Data rate range for voice transmission	32 kbps standard 16 to 64 kbps alternatively	
Voice channel performance at 32 kbps		
Idle channel noise	23 dBrnC0 maximum	
Harmonic distortion	-25 dBm0 maximum	
Intermodulation distortion	-36 dBm0 maximum	
Dynamic range	+3 to -47 dB	
Level stability	±0.25 dB	
Channel gain	23 dB ±0.5 dB or 0 dB ±0.5 dB	
Signal to quantizing noise	**Signal Level (dBm0)**	**S/N (dB)**
	-45 to -32	20 (average)
	-32 to -24	28 (average)
	-24 to 0	30

TABLE 100-1. TECHNICAL CHARACTERISTICS (Cont.)

Item	Characteristic
E and M signaling states	
E-lead relay	Open=idle Closed=busy
M-lead detector	Compatible with Type 1-5 signaling interface
E-lead relay ratings	
Maximum current	0.25 A
Maximum voltage	100 V dc
Power requirements	
VCH-1A	+5 V dc ±5% at 525 mA +12 V dc ±5% at 30 mA -12 V dc ±5% at 70 mA
VCH-3A	+5 V dc ±5% at 520 mA +12 V dc ±5% at 20 mA -12 V dc ±5% at 70 mA
Environmental	
Ambient temperature	Operating: 0 to 70°C Nonoperating: -40 to 85°C
Humidity	Up to 95% relative humidity, no condensation
Altitude	Operating: 0 to 10,000 ft (3048 m) Nonoperating: 0 to 40,000 ft (12,192 m)

TABLE 100-2. VOICE CHANNEL CARD EDGE CONNECTOR (P1)

P1 Pin No.	Description	DB-25 Conn. (on backplane)
1	Chassis Ground	1
2	AF ROW SEL	
3	-12 Vdc	
4	Signal Ground	7
5	+5 Vdc	
6	Sync Bus	
7	ϕ2 Clock (not used)	
8	RESP B/A	
9	ϕ1 Clock (not used)	
10	XC ROW SEL	
11	D BUS	
12	W BUS	
13	Y BUS	

TABLE 100-2. VOICE CHANNEL CARD EDGE CONNECTOR (P1) (Cont.)

P1 Pin No.	Description	DB-25 Conn. (on backplane)
14	CB1	
15	CB2	
16	CB3	
17	CB4	
18	RESP1	
19	RESP2	
20	RESP3	
21	RCV DATA BUS	
22	Card ALM/ACO	
23	DIGITAL LBK	6
24	Tip Out	4
25	Ring Out	5
26	VF LBK	20
27	SB (station battery)	15
28	M-Lead	3
29	+12 Vdc	
30	AF COL SEL	
31	-12 Vdc	
32	Signal Ground	7
33	+5 Vdc	
34	Minor Alarm Bus	
35	XD ROW SEL	
36	XD COL SEL	
37	XC COL SEL	
38	XMIT DATA BUS	
39	OS BUS	
40	X BUS	
41	Z BUS	
42	CB5	
43	CB6	
44	CB7	
45	RD ROW SEL	
46	RC ROW SEL	
47	RC COL SEL	
48	RESP4	
49	RD COL SEL	
50	No Connection	
51	Tip In	25
52	Ring In	10
53	SG (station ground)	8
54	E'-Lead	11
55	-Battery	2
56	E-Lead	24

NOTE: The E'-lead is not functional on the TDM 1253.

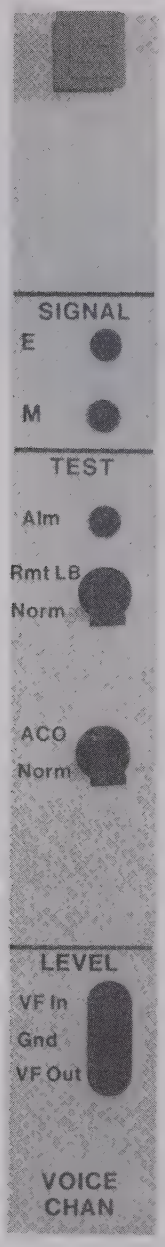


FIGURE 120-1. FRONT PANEL COMPONENTS

SECTION 120 — OPERATION

1.0 INTRODUCTION

This section contains operating instructions for the Voice Channel module. The information is presented in terms of functional descriptions for all front panel controls, which are seen in Figure 120-1. Related descriptions are given in Table 120-1.

TABLE 120-1. MODULE FRONT PANEL COMPONENTS

Item	Functional Description
SIGNAL	
E indicator	Lights to indicate that E-lead is in the Busy state (not present on VCH-3A).
M indicator	Lights to indicate that M-lead is in the Busy state (not present on VCH-3A).
TEST	
Alm indicator	Lights to indicate that remote loopback function has been initiated at either end.
Rmt LB/Norm switch	Rmt LB position actuates analog remote loopback. Norm position restores module to normal voice channel operation.
ACO/Norm switch	ACO position removes the channel alarm generated by the remote loopback function. Norm position restores module to normal voice channel operation.
LEVEL	
VF In test point	Permits measurement of Voice Channel input level; isolated through 10 k Ω resistor.
Gnd	Signal ground.
VF Out test point	Permits measurement of Voice Channel output level; isolated through 10 k Ω resistor.

SECTION 200 — INSTALLATION

1.0 GENERAL

This section provides installation instructions for the Voice Channel module. Installation consists of module insertion into and extraction from the assigned receptacle of the TDM unit.

2.0 MODULE REMOVAL AND INSTALLATION

The module may be installed or removed from its assigned receptacle at any time without affecting system operation.

NOTE

The VCH-1A uses a mercury-wetted relay and must be oriented within 30° of the vertical position for proper operation.

2.1 MODULE REMOVAL

To remove the module, grasp the front panel knob firmly and pull the module loose from its mating connector; then use both hands to guide it straight out from the receptacle.

2.2 MODULE INSTALLATION

To install the module, proceed as follows:

a. Verify the correct module location in TDM unit.

b. Refer to attached drawing package and verify that the module has options implemented correctly. See paragraph 3.0, Option Selection, for more information.

CAUTION

Mating connectors are keyed for module assignment. Do not force mating.

c. Position the module in the receptacle guides (top and bottom) and carefully slide the module into the receptacle until it stops at the rear connector.

d. Push the module into the rear connector with a firm snapping action, using both hands at the front panel.

3.0 OPTION SELECTION

A number of user options are provided on the Voice Channel module. These options are related to whether the module is used with TDM 1253 or 1257/1258 systems; to selecting a filter clock signal and a data rate clock signal; to selecting input and output levels; and to selecting E and M signaling options.

All options are selected by proper placement of jumper plugs on header pins. Figure 200-1 indicates the location of all option headers. Table 200-1 lists the available options.

NOTE

Voice Channel modules bearing GDC Part No. 036P061 are not end-to-end compatible with Voice Channel modules, Part No. 036P071. Both types may be used in a system, but communicating channels must be of the same type (Part No.).

3.1 CLOCK OPTIONS

The Voice Channel module requires two separate clock signals for proper operation. One clock, the filter clock, is a 128-kHz clock signal used for internal timing and for clocking the switched-capacitor audio filter. The other clock, nominally a 32-kHz clock signal, is the data rate clock. (Improved performance may be obtained using higher data rates, up to a maximum rate of 64 kHz.) Both clock signals are generated by the TDM Clock Generator module and selected from seven clock buses, CB1 through CB7, by proper placement of jumper plug FC for the filter clock; and jumper plug DC for the data rate clock. Only one clock bus should be selected for each of the two clocks. (Note that the arrangement of FC and DC prevents selecting a data rate clock that is equal in frequency to the filter clock.) Clock bus frequencies cannot be specified here as the frequencies assigned to the buses may differ from one installation to the next, and even from one shelf to the next within a given TDM. See the configuration drawing package supplied with TDM for identity of clock bus frequencies.

NOTE

TDM 1253 must be equipped with a 1257 Clock Generator to provide 128-kHz clock signal to the Voice Channel module.

3.2 EXTERNAL ELECTRICAL CONNECTIONS

Cables are used to connect the local and remote VCH modules to their respective terminating equipment. Typical installations are illustrated in Figures 200-2 and 200-3 using several types of cables.

4.0 PREOPERATIONAL CHECK

The preoperational check of the Voice Channel module is accomplished in an operational TDM unit (one containing a full complement of common modules). Before placing the TDM unit into system operation, perform the preoperational check to ensure that the Voice Channel module's performance is within specifications. If any requirement of the check cannot be obtained, replace the module, if a spare is available, and repeat check. Perform the preoperational check in accordance with the instructions given in Section 500, Tests. Do not attempt equipment repair beyond module replacement.

Should further assistance be required, please contact DataComm Service Corporation. For toll-free 24-hour-a-day emergency trouble reporting, call 1-800-243-1030. For technical assistance, customers located outside Connecticut should call 203-797-0711 during business hours (8:00 a.m. to 5:00 p.m. EST/EDST). Connecticut customers should call 797-0711 during business hours and 797-0920 after business hours. (DataComm Service Corporation is a subsidiary of General DataComm Industries, One Kennedy Avenue, Danbury, Connecticut 06810.) To return the module to the factory for repair, if so directed by telephone, use the return tag and address the package:

Product Repair Department
DataComm Service Corporation
One Kennedy Avenue
Danbury, Connecticut 06810

In Canada:

General DataComm Ltd.
Service and Repair Facility
4140 Thimens Blvd.
St. Laurent, Montreal, Quebec H4R 2B9
Telephone: 1-514-336-5454
TWX: 610-421-3221
Telex: 05 824085

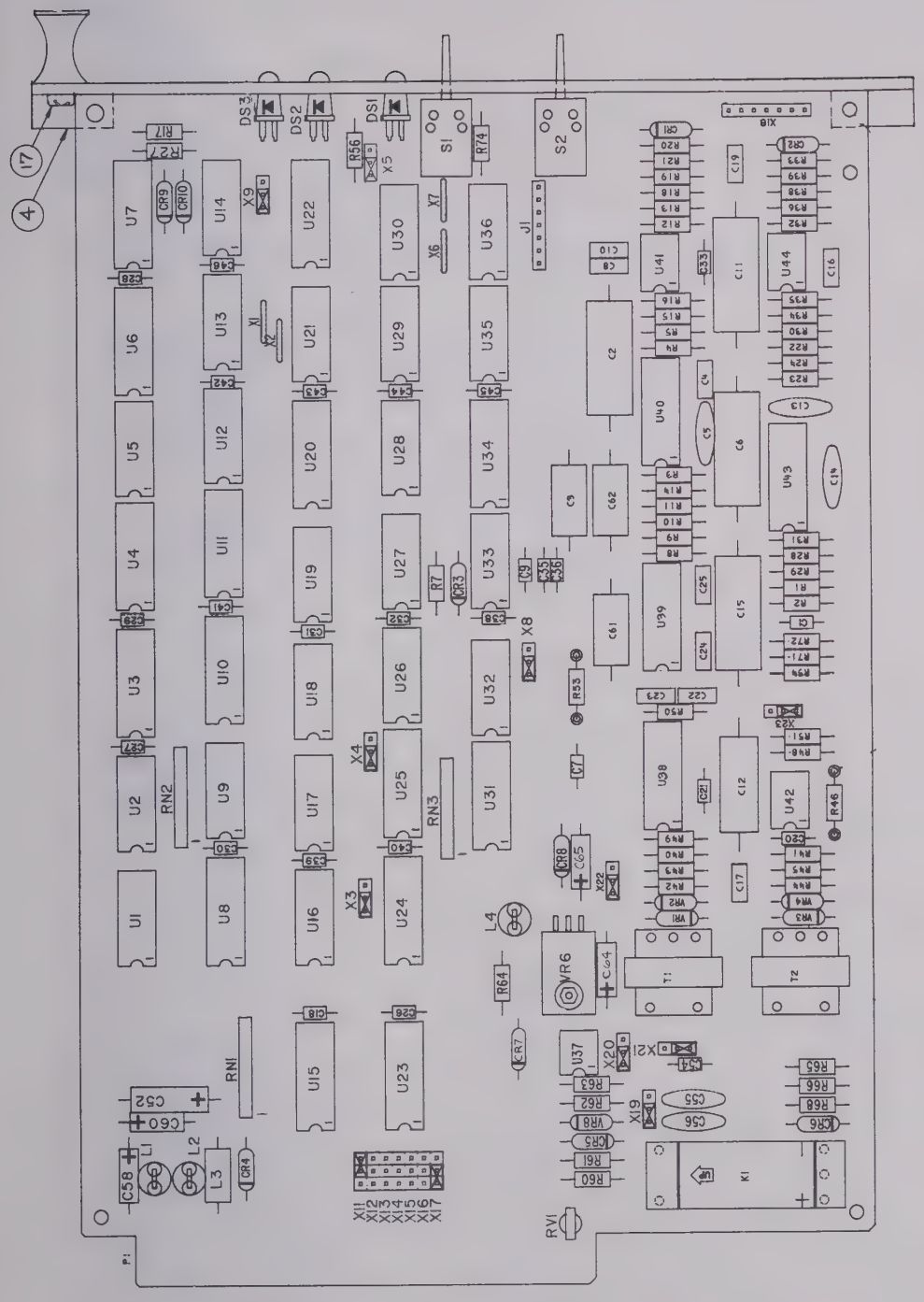


FIGURE 200-1. OPTION SELECTION DEVICES, COMPONENT BOARD ASSEMBLY (036P071)

TABLE 200-1. FIELD-SELECTABLE OPTIONS

Header Designation	Position	Description
Configuration Options		
X3	SCH	Autoframe module lists channel as a Synchronous Channel on System Status Monitor.
	VCH	Autoframe module lists channel as a Voice Channel on System Status Monitor.
		NOTE *In 1257/58 systems, which do not have the necessary modifications to the Autoframe card, SCH position must be selected by X3.*
X4	57/8	Configures W,X,Y, and Z control buses as four bidirectional buses. Provides for Autoframe response buses RESP1, RESP2, RESP3, and RESP4.
	53	Configures W,X,Y, and Z control buses as four transmit buses and RESP1, RESP2, RESP3, and RESP4 as four receive buses.
	FC	Selects filter clock.
	X11	Clock bus 1
	X12	Clock bus 2
	X13	Clock bus 3
	X14	Clock bus 4
	X15	Clock bus 5
	X16	Clock bus 6
	X17	Clock bus 7
	DC	Selects data rate clock.
	X11	Clock bus 1
	X12	Clock bus 2
	X13	Clock bus 3
	X14	Clock bus 4
	X15	Clock bus 5
	X16	Clock bus 6
	X17	Clock bus 7

NOTE

Clock bus carrying 128 kHz must be selected.

NOTE

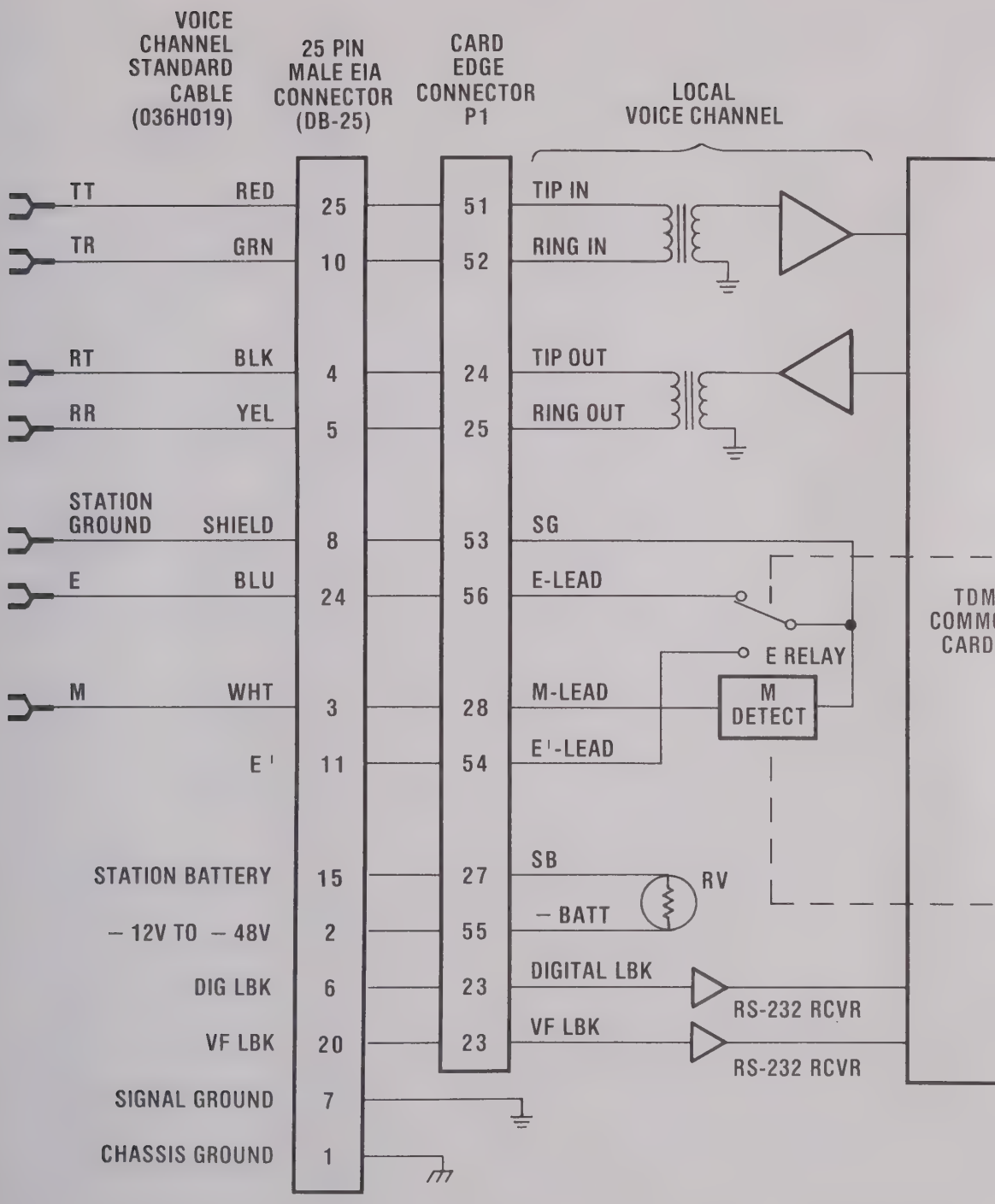
Clock bus carrying 32 kHz should be selected for specified operation.

TABLE 200-1. FIELD-SELECTABLE OPTIONS (Cont.)

Header Designation	Position	Description
		Level Options
X22	LVL IN −16 0	Determines input level selection. Normal operation (−16 dBm input level). 0 dBm input level.
X23	LVL OUT +7 0	Determines output level selection. Normal operation (+7 dBm output level). 0 dBm output level.
X18		Front panel test points for VF measurement.
		M-Lead Signaling Options
X19	GND M	Type 1, 2, and 3 operation. Type 4 and 5 operation.
X20	M BATT	Type 1, 2, and 3 operation. Type 4 and 5 operation.
X21	GND BATT	Type 1, 4, and 5 operation. Type 2 and 3 operation. **NOTE** *Refer to Figure 200-4, A to E, for details of the various M-lead signaling types.*
		Loss of Power Option
X8	BUSY	The relay is de-energized for the busy condition. The E-lead (P1-56) should be used for E signaling. This position is typically used for the trunk and foreign exchange applications.
X8	IDLE	The relay is energized for the busy condition. The E′-lead (P1-54) should be used for signaling. This position is typically used for ringdown applications.
X25, X26	BUSY	The normally closed side of the relay is connected to E-lead (P1-56); the normally open side is connected to E′-lead (P1-54). During power failure, the E-lead relay will be "busy".
X25, X26	IDLE	The normally closed side of the relay is connected to E′-lead (P1-54); the normally open side is connected to E-lead (P1-56). During power failure, the E-lead relay will be "Idle". **NOTE** *On channel cards having options X25 and X26, the jumper positions for X8, X25 and X26 must all agree. Any other combination will result in erroneous E-lead signaling. When X25 and X26 are provided, all E-lead signaling is output on E-lead (P1-56); disregard the description under X8 above.*

TABLE 200-1. FIELD-SELECTABLE OPTIONS (Cont.)

Header Designation and Position		Description
Loopback Option		
X24	NORM	The M-lead is forced to busy state during a remote loopback test initiated at either end of the system.
X24	RD	The M-lead is not affected by a remote loopback test. This position is intended for ringdown applications.
Loss of Sync Options		
X5	X9	
NORM	NORM	After sync is lost, the E-lead is forced to the idle state for 2.5 seconds and then is forced to the busy state.
NORM	INH	The E-lead is forced to the busy state 2.5 seconds after sync is lost.
INH	NORM	The E-lead is forced to the idle state when sync is lost.
INH	INH	The E-lead remains unchanged when sync is lost.


VOICE CHANNEL STANDARD CABLE (036H019)
25 PIN MALE EIA CONNECTOR (DB-25)
CARD EDGE CONNECTOR P1
LOCAL VOICE CHANNEL
TT
RED
25
51
TIP IN
TR
GRN
10
52
RING IN
RT
BLK
4
24
TIP OUT
RR
YEL
5
25
RING OUT
STATION GROUND
SHIELD
8
53
SG
E
BLU
24
56
E-LEAD
E RELAY
M
WHT
3
28
M-LEAD
M DETECT
E'
11
54
E'-LEAD
STATION BATTERY
15
27
SB
RV
– 12V TO – 48V
2
55
– BATT
DIG LBK
6
23
DIGITAL LBK
RS-232 RCVR
VF LBK
20
23
VF LBK
RS-232 RCVR
SIGNAL GROUND
7
CHASSIS GROUND
1
TDM COMM CARD

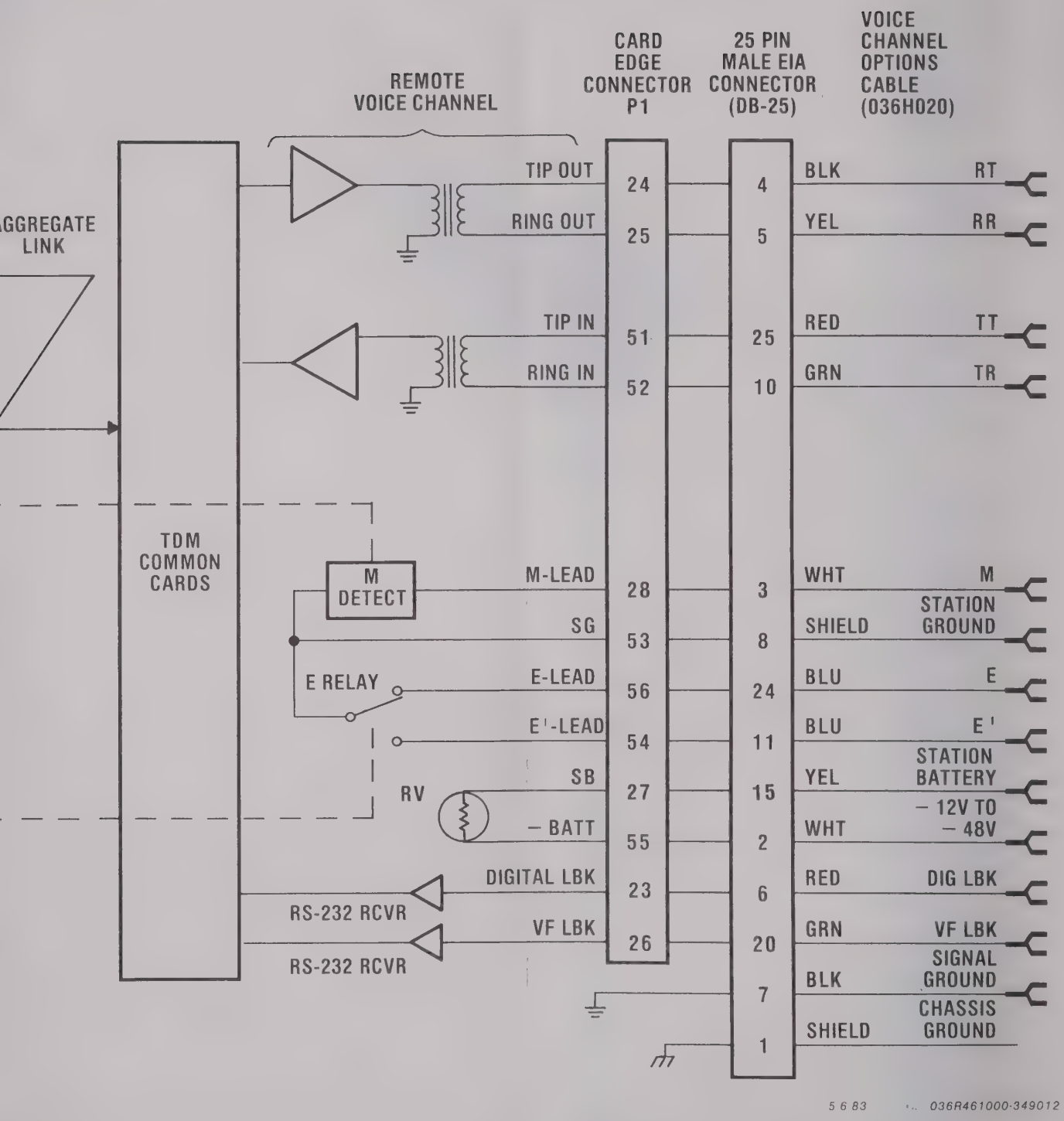
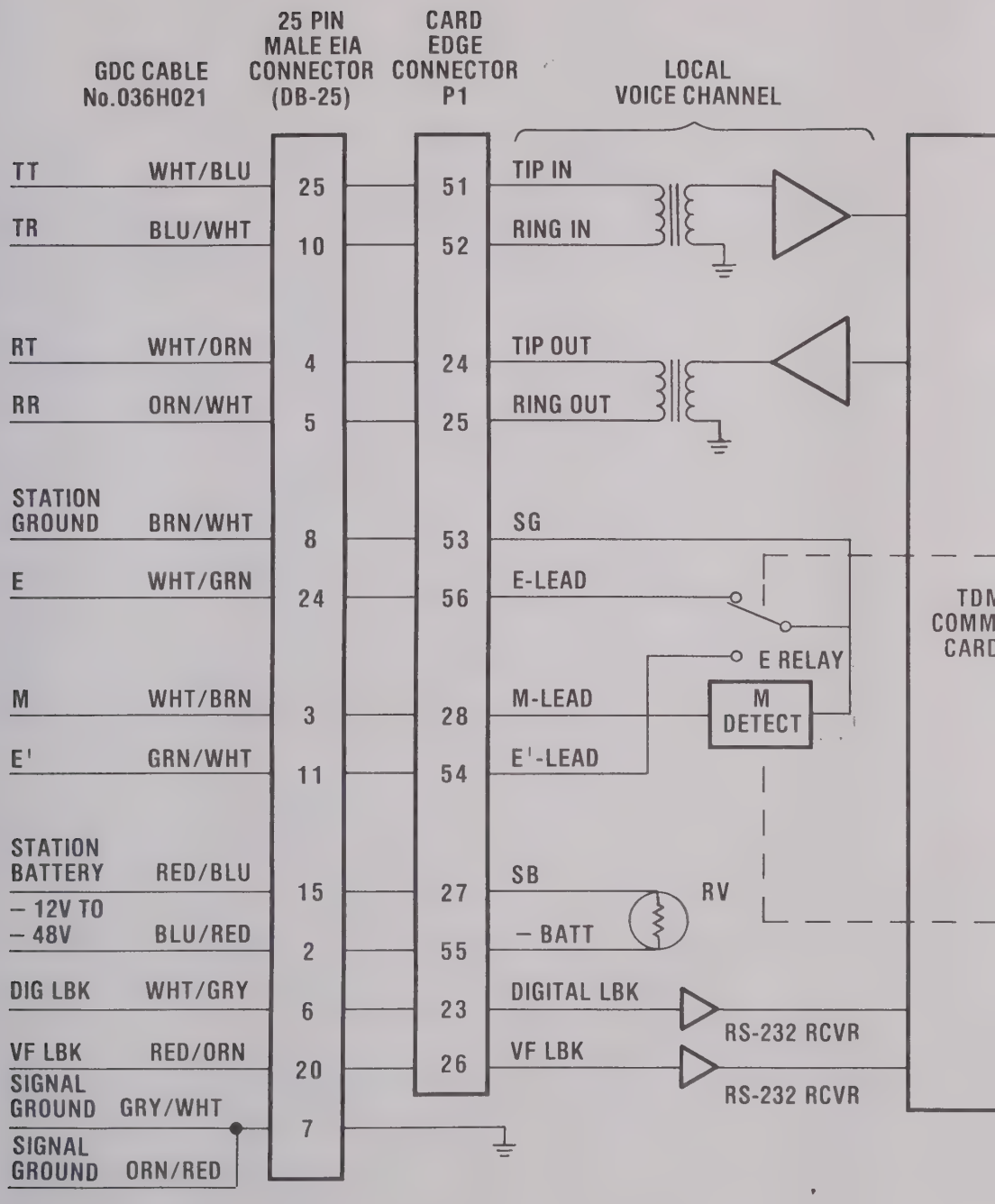
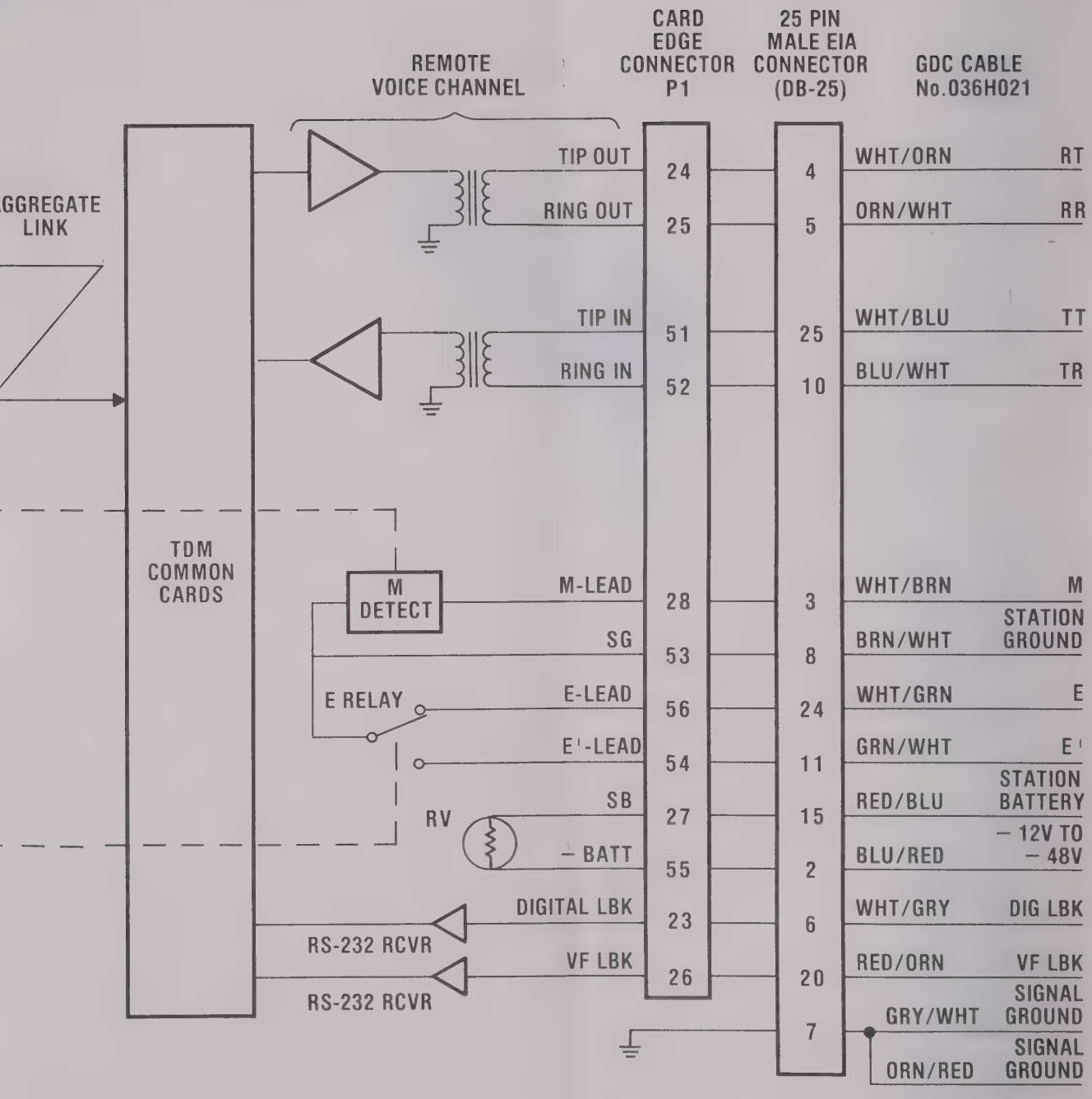


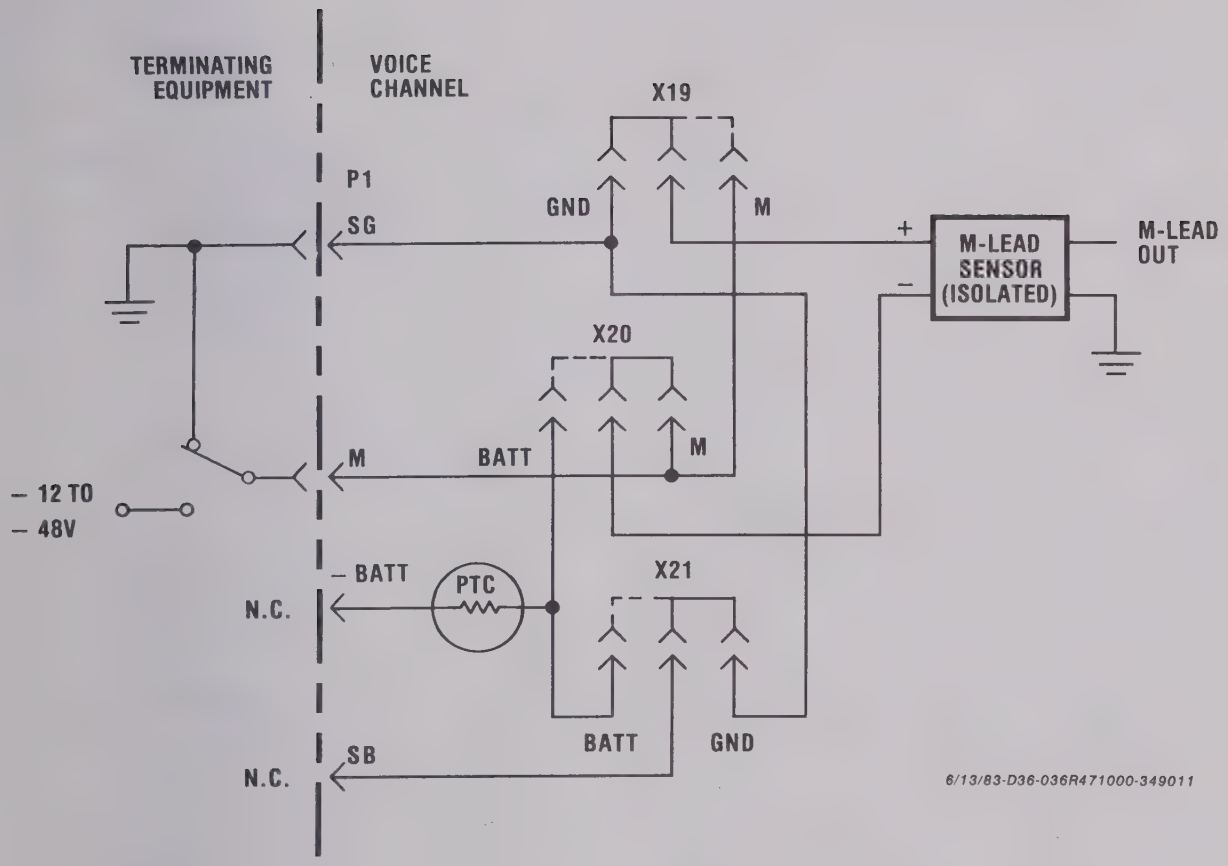
FIGURE 200-2. TYPICAL EXTERNAL CONNECTION BETWEEN LOCAL AND REMOTE VCH MODULES


GDC CABLE No.036H021
25 PIN MALE EIA CONNECTOR (DB-25)
CARD EDGE CONNECTOR P1
LOCAL VOICE CHANNEL
TT WHT/BLU
TR BLU/WHT
RT WHT/ORN
RR ORN/WHT
STATION GROUND BRN/WHT
E WHT/GRN
M WHT/BRN
E' GRN/WHT
STATION BATTERY RED/BLU
– 12V TO – 48V BLU/RED
DIG LBK WHT/GRY
VF LBK RED/ORN
SIGNAL GROUND GRY/WHT
SIGNAL GROUND ORN/RED
25
10
4
5
8
24
3
11
15
2
6
20
7
51
52
24
25
53
56
28
54
27
55
23
26
TIP IN
RING IN
TIP OUT
RING OUT
SG
E-LEAD
E RELAY
M-LEAD
M DETECT
E'-LEAD
SB
RV
– BATT
DIGITAL LBK
RS-232 RCVR
VF LBK
RS-232 RCVR
TDM COMM CARD



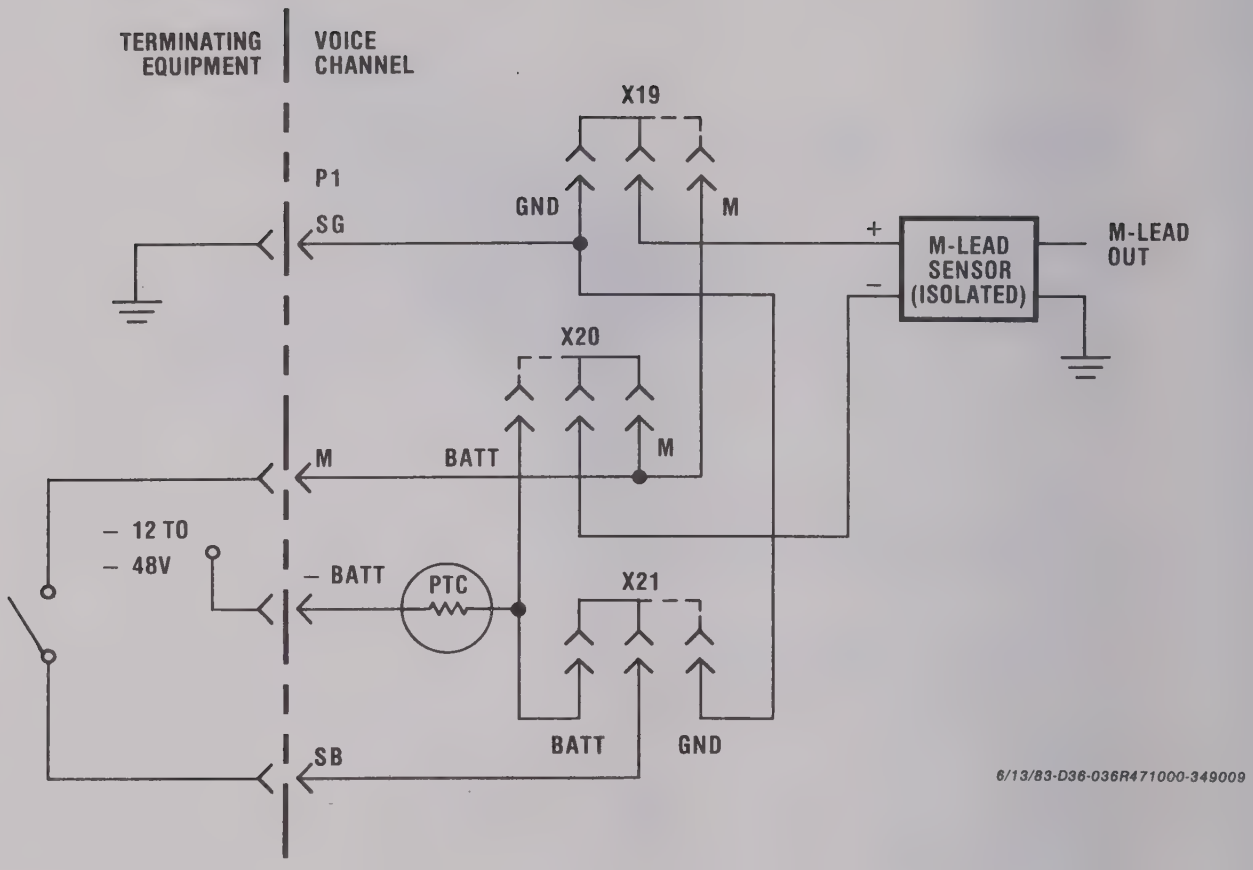
5 6 83 036R461000-349013

FIGURE 200-3. TYPICAL CONNECTION USING GDC PUNCH-DOWN CABLE (Part No. 036H021)



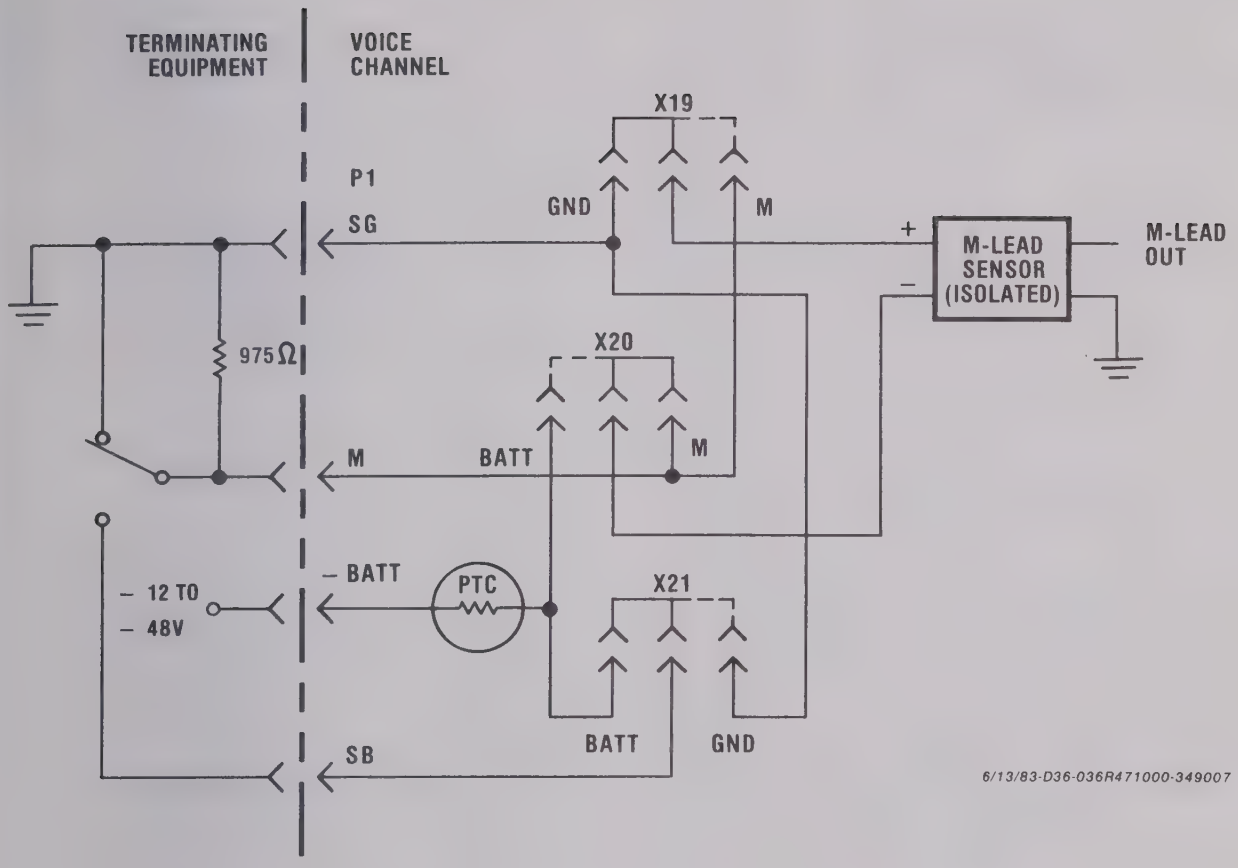
A. TYPE 1

FIGURE 200-4. M-LEAD SIGNALING



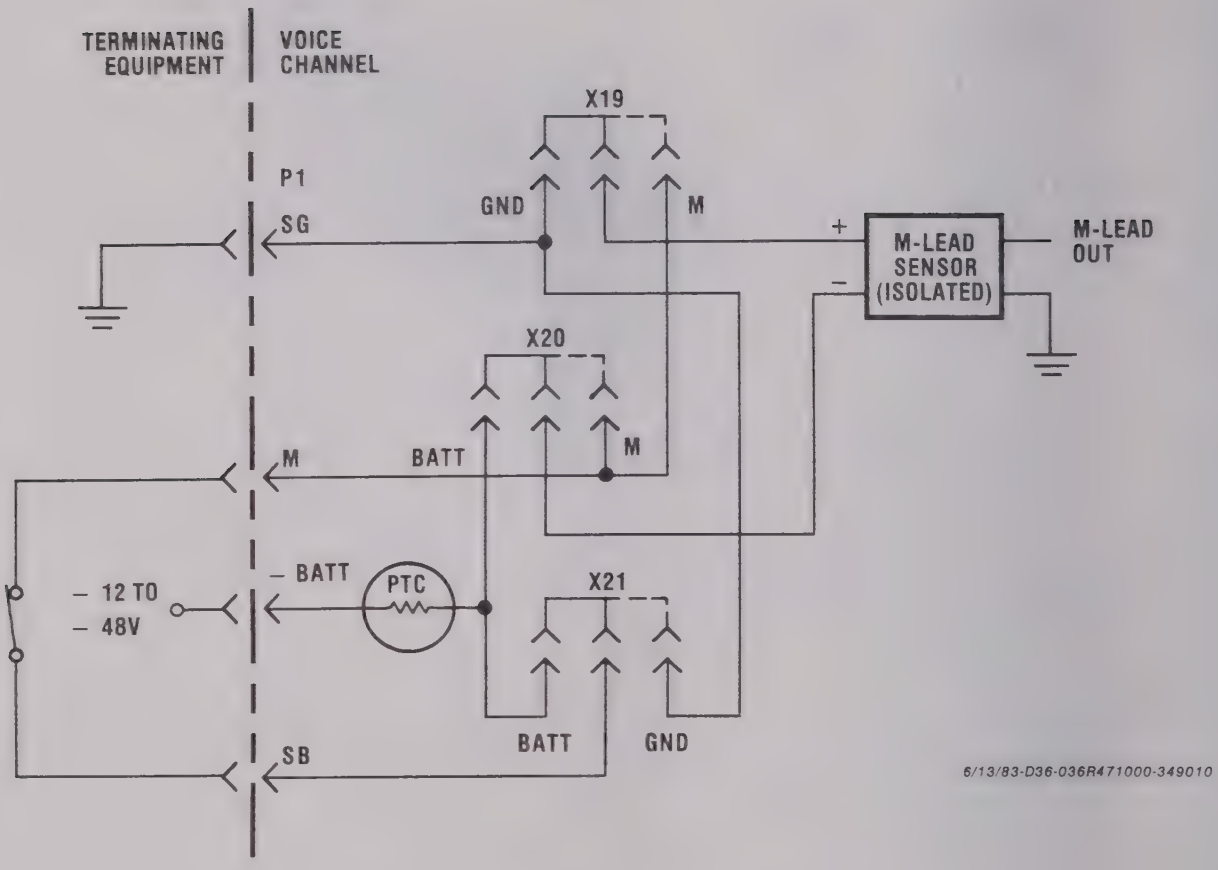
B. TYPE 2

FIGURE 200-4. M-LEAD SIGNALING
(Cont.)



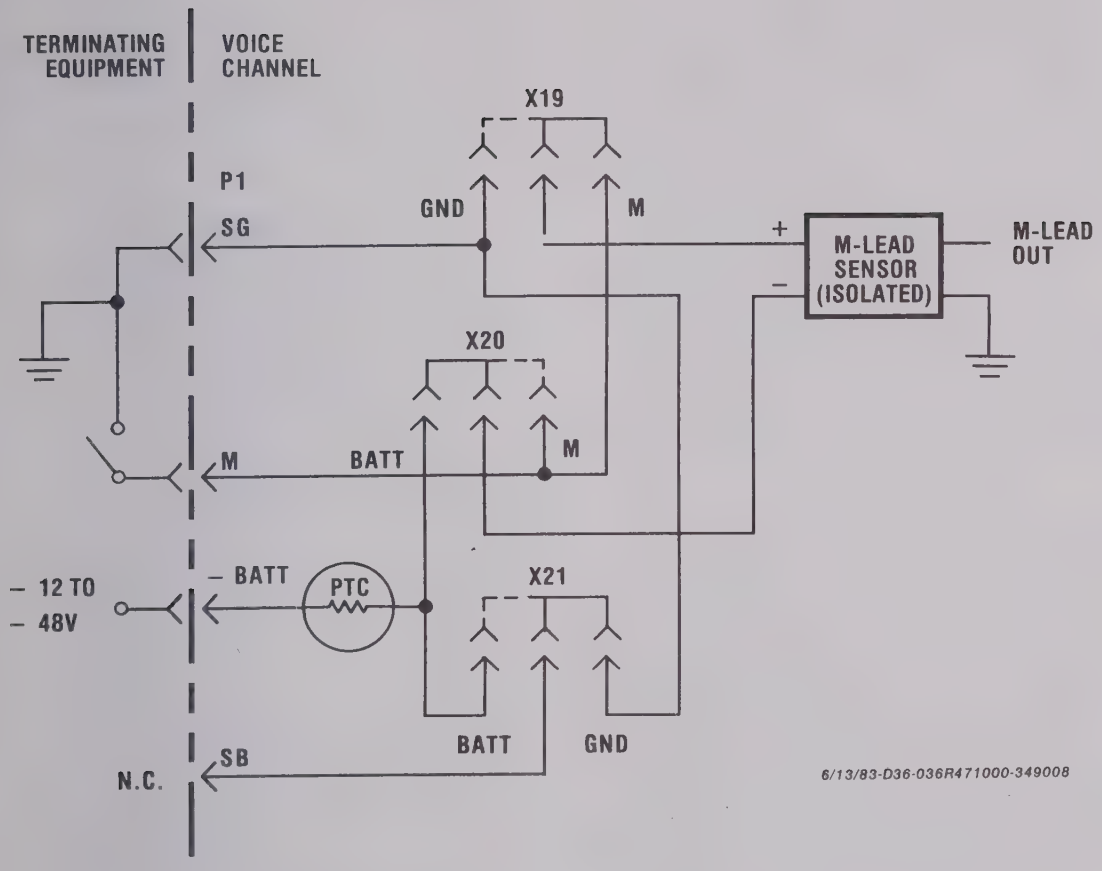
C. TYPE 3

FIGURE 200-4. M-LEAD SIGNALING
(Cont.)



D. TYPE 4

FIGURE 200-4. M-LEAD SIGNALING
(Cont.)



E. TYPE 5

FIGURE 200-4. M-LEAD SIGNALING
(Cont.)

SECTION 500 — TESTS

1.0 GENERAL

This section contains tests that are to be performed on the Voice Channel module after installation, after a repair has been made, or whenever performance must be verified. These tests may also be used for isolating troubles in the system to the module level, and as a preoperational check, as appropriate. Before undertaking the tests outlined below, it should be confirmed as a matter of course that existing symptoms of a malfunction, if any, are not multichannel in nature.

2.0 ANALOG REMOTE LOOPBACK

This test may be used to verify proper operation of the Voice Channel through the aggregate and any intervening tandem link equipment (if used) to the remote Voice Channel–equipped TDM as well as the return path to the initiating local TDM, as shown in Figure 500-1. In the case of transmission over a tandem TDM channel, the analog signal is looped back at the first Voice Channel encountered. During an Analog Remote Loopback test, the E-lead and M-lead signals at both ends are forced to the busy state. To perform the analog remote loopback test, proceed as follows:

a. Set Rmt LB/Norm switch on front panel to Rmt LB position.

b. Check that Alm (alarm) indicator is lighted. This indicates that an alarm has been generated on the minor alarm bus. The E and M indicators should also be illuminated. Indicators at both sites should be illuminated.

c. A tone generator or other source of audiofrequencies may be connected to the VF In and Gnd test points on the Voice Channel front panel. The recommended tone source output level is 2.75 volts peak-to-peak (+2 dBm) at 1 kHz. Option header X7 (LVL IN) should be placed at -16 dB. Option header X11 (LVL OUT) should be placed at +7 dB, and both VF inputs should be properly terminated (600Ω between tip and ring). An oscilloscope may be connected (if a dual channel scope) to the VF In and VF Out test points so that the applied signal and the looped-back signal can be compared. An alternative method of measurement could employ an analog voltmeter (Hewlett-Packard Model 427A or equivalent) connected between VF Out and Gnd.

d. Observe the oscilloscope or meter for an amplitude deflection resulting from the loopback signal. For the conditions specified above, an oscilloscope should show approximately the same amplitude signal; a voltmeter should indicate an approximate gain of 0 to 2 dB (.75 to 1 V rms).

NOTE

Use of alternate input levels or level selection options will yield different results.

3.0 DIGITAL REMOTE LOOPBACK

The Voice Channel also permits the performance of a digital remote loopback test. This feature permits the testing of the digital path in a tandem system only, in which the tandem link TDMs are equipped with Synchronous Channel modules, as shown in Figure 500-1. Loopback will occur at the input of the first Synchronous Channel encountered. A remote Voice Channel will ignore a received digital loopback command.

TABLE 500-1. VCH MODULE ANALOG/DIGITAL REMOTE LOOPBACK LEVEL TEST

	Input Levels	Input Level Selector (X22)	Output Level Selector (X23)	Output Level
High Input Level Test	0 dBm → 16 dBm	0→-16	0→+7	0 dBm→+7 dBm
Low Input Level Test	-20 dBm→-36 dBm	0→-16	0→+7	-20 dBm→-13 dBm

*Terminate both VF pairs into 600 ohms.

NOTE: The above table is valid for inputs applied to TIP IN and RING IN (P1-51 and P1-52). It is not valid for inputs applied to the front panel test points VF In and VF Out.

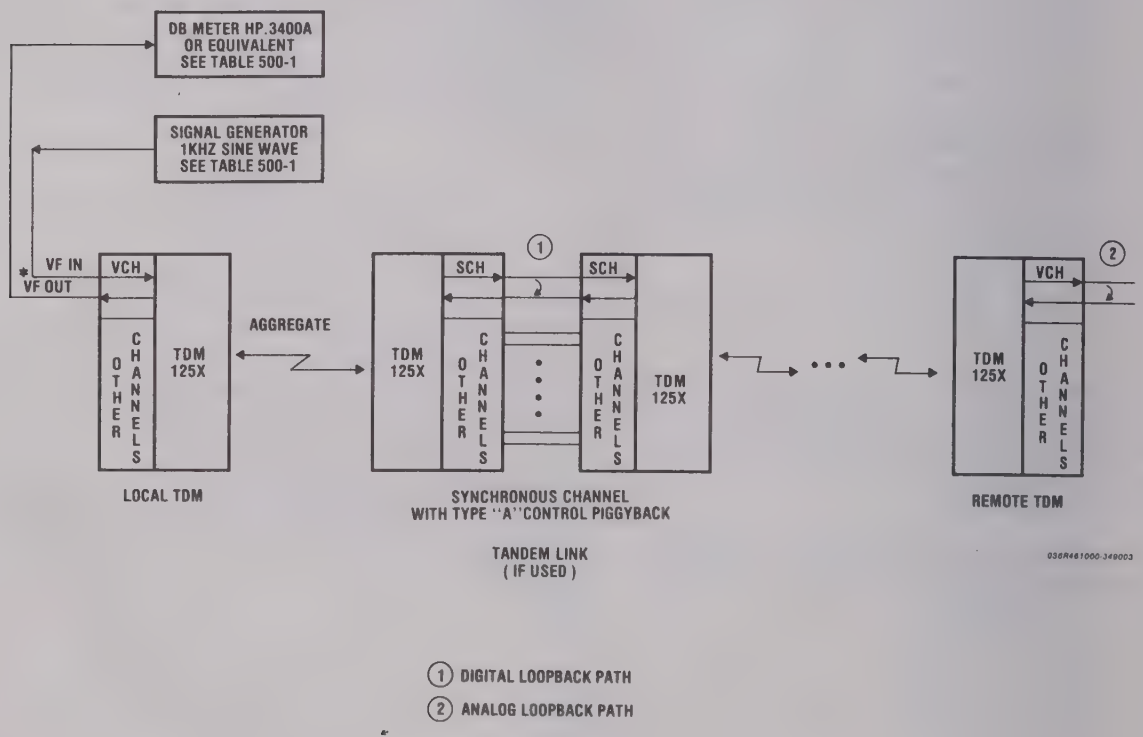


FIGURE 500-1. VCH MODULE ANALOG/DIGITAL REMOTE LOOPBACK TEST

SECTION 700 —DIFFERENCE DATA

1.1 GENERAL

Individual Difference Data Sheets are prepared to cover modifications to GDC equipment. As these changes occur, they are incorporated into the equipment. The Difference Data Sheets include a cover sheet which is sequentially numbered and printed on buff paper and briefly describes the modification as well as provides a list of pages affected in this manual. Initially, the affected pages are updated and printed on pink paper and stapled to the cover sheet. These are attached to the top of the basic manual. The pink pages are to be inserted into the appropriate sections of the manual in place of the identically numbered white pages. The buff Difference Data cover sheet then should be placed in Section 700 with the removed, obsolete pages behind it for future reference. At the next printing of this manual, the Difference Data cover sheet will be printed on buff paper and bound into the manual in Section 700 along with the obsolete pages. (Paragraph 1.1 in Section 100 will so state when this has been done.) The new pages will be bound in the appropriate sections of the manual. In this way the manual will cover both the latest equipment and the unmodified equipment previously delivered.

1.2 PRINTED CIRCUIT CARD REVISION DESIGNATORS

Modifications of printed circuit cards or of plug-in ("piggyback") elements of these cards, and revisions of supporting diagrams are indicated by letter and number codes on the printed circuit card. Brief explanations of these codes are presented below. Refer to Figure 700-1.

1.2.1 **Assembly Number** — Each printed circuit card is usually marked on its component side with a number that identifies its physical configuration (see Figure 700-1, B). The digits before the box form a base number which is assigned to the original and remains unchanged regardless of subsequent modifications. The digits following the box — the so-called dash number — are used when a basic design is offered in several versions concurrently and the mechanical assembly prints for the various versions coexist under different dash numbers. In addition, dash numbers are changed or added when a physical modification is made to the card (that is, new application) which changes the card so that it is no longer a replacement for the original dash number. The letter appearing in the PUB REF REV LEV box on the mechanical assembly drawing (component location diagram) in the manual is for publication use only.

1.2.2 **Printed Circuit Identifier** — The base digits of the assembly number also appear on the opposite surface of the card where they identify the printed circuit configuration (see Figure 700-1, A). In this case the last three digits are always "101." A revision in the pattern of the printed conductors ("artwork") is indicated by a letter and a dash after the "101" digits. It designates the printed circuit configuration incorporating these changes.

1.2.3 **Schematic Revision Letters** — Any circuit change which entails revision of the schematic diagram is indicated by a black sticker with a white letter affixed to the component side (Figure 700-1, B). The circuit configuration represented by this letter is a direct replacement for all previous production versions.

For a piggyback element, a change involving the revision of the schematic diagram is indicated by a black sticker with a white letter affixed to the card (Figure 700-1, A). Likewise, the circuit configuration represented by this letter supersedes all previous production versions.

The letter appearing in the PUB REF REV LEV box on the schematic diagram in Section 650 of the Instruction or Maintenance manual identifies the configuration of the unit represented by the associated diagram. The PUB REF REV LEV letter on the schematic diagram in the manual and the schematic revision letter on the unit serve the same function.

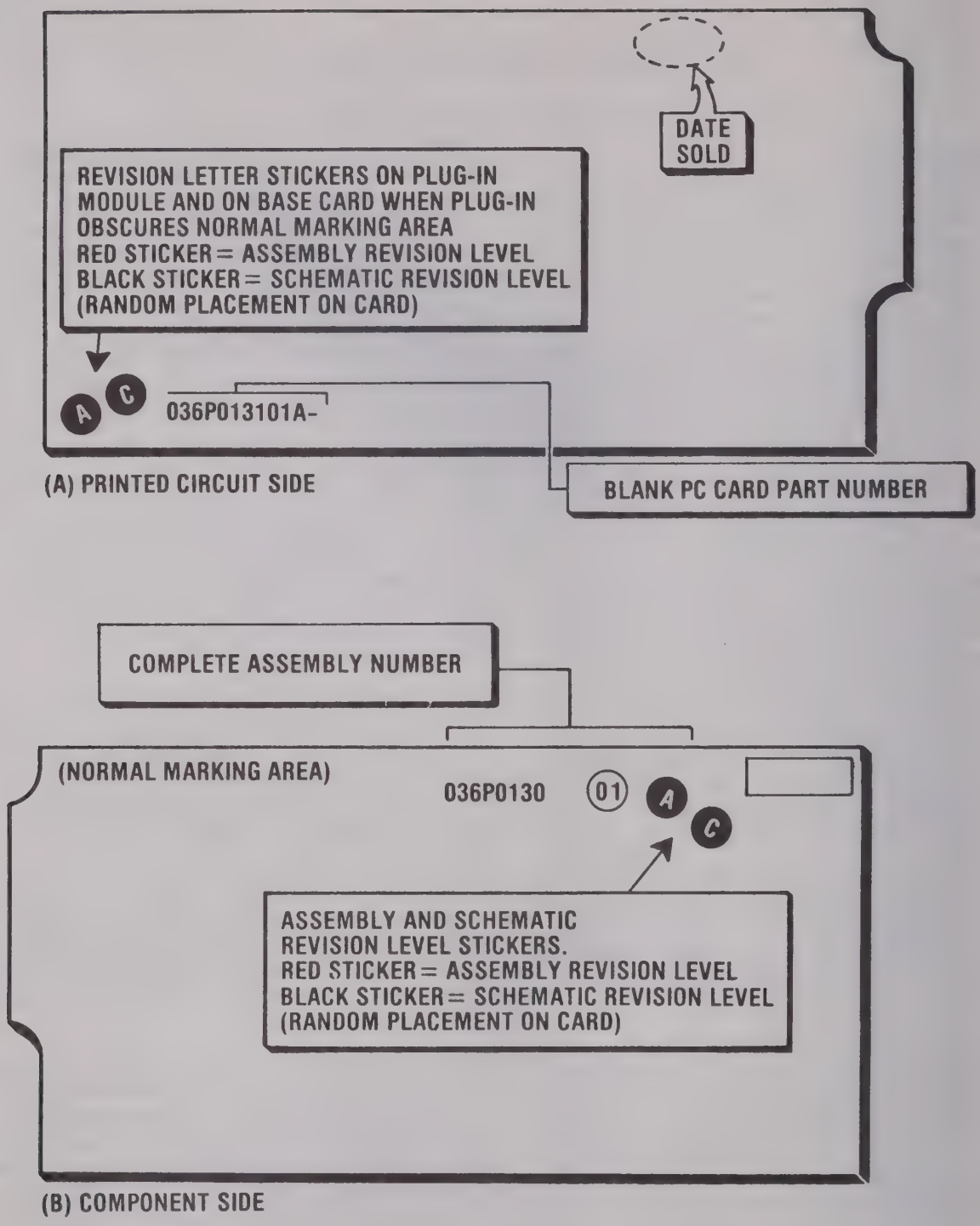


FIGURE 700-1. PRINTED CIRCUIT CARD REVISION DESIGNATORS

GDC's goal is to provide technical manuals that match the high quality and dependability of our manufactured products. Thus GDC wishes to be informed of any procedures which, in your opinion, are inaccurate, deficient, or prove impractical in the field. Simply fill in one of the attached cards, tear it out and drop it in the mail. Thank you.

PRODUCT NAME AND TYPE NO. _____

PUBLICATION NO. _____ ISSUE AND DATE _____

PROBLEM AREA			SUGGESTIONS
Section	Para., Fig., or Table No.	Pg. No.	

GENERAL REMARKS:

NAME _____ COMPANY _____

TITLE _____ ADDRESS _____

_____

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PUBLICATION NO. _____ ISSUE AND DATE _____

PROBLEM AREA			SUGGESTIONS
Section	Para., Fig., or Table No.	Pg. No.	

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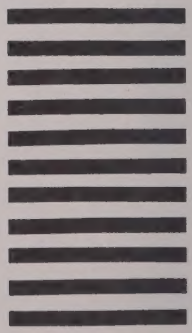

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